

DaimlerChrysler AG

Patent claims

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1. A belt roller (1) for a safety belt system in a motor vehicle,
- having a device (3) which locks the belt roll (2) in the event of a belt velocity which exceeds a threshold value and/or in the event of a vehicle deceleration/acceleration which exceeds a threshold value,
  - the belt roll (2) having a torsion bar (5) which runs in its axial direction (4) and forms a torsionally resilient element,
  - the torsion bar (5) being connected at one end to the locking device (3) and at the other end to the belt roll (2), and it being possible to set the maximum possible torsional resistance at least as a function of the weight of the respective user of the safety belt (22) by automatically altering the active portion of the torsion bar,
- characterized
- in that at least one coupling element (6), which can be adjusted on the torsion bar (5) by axial movement between an active position, in which it is rotationally fixedly connected to the torsion bar (5) on one side and the belt roll (2) on the other side, and a passive position, in which it is not rotationally fixedly connected to either the belt roller or the torsion bar, or is rotationally fixedly connected only to the belt roller (1) or only to the torsion bar (5), is provided between the locking device (3), on one side, and the connection of the torsion bar (5) to the belt roll (2), on the other side.

2. The belt roller as claimed in claim 1, characterized in that the cross section of the torsion

bar (5) decreases conically starting from its clamping location assigned to the lockable device (3).

3. The belt roller as claimed in claim 1 or 2,  
5 characterized in that the coupling element (6) is designed as a torsion-proof sleeve.

4. The belt roller as claimed in one of claims 1  
to 3, characterized  
10 - in that the coupling element (6) has internal  
toothings (7),  
- in that the torsion bar (5) has external toothings  
(8) which is complementary to or matches the  
internal toothings (7) of the coupling element (6).

15 5. The belt roller as claimed in claim 4,  
characterized in that the internal toothings (7) and the  
external toothings (8) have tooth peaks and tooth  
valleys which run parallel to the axis (4) of the  
20 torsion bar (5).

6. The belt roller as claimed in one of claims 1 to  
5, characterized  
- in that the coupling element (6) has an external  
25 contour (10) which is not round,  
- in that a cavity (9) which runs inside the belt roll  
(2) has an internal contour (11) which substantially  
matches the external contour (10) of the coupling  
element (6).

30 7. The belt roller as claimed in one of claims 1  
to 6, characterized in that the axially adjacent  
coupling elements (6) which are not round in cross  
section are arranged circumferentially rotated with  
35 respect to one another.

8. The belt roller as claimed in either of claims 6  
and 7, characterized

- in that projecting cams (12) are provided as a non-round external contour (10) of the coupling element (6),
- in that the cavity (9) includes recesses (13) which  
5 run parallel to the axis (4) of the torsion bar (5).

9. The belt roller as claimed in one of claims 1 to 8, characterized in that an actuating drive (14) is provided coaxially with the torsion bar (5) for the  
10 purpose of adjusting the coupling element (6).

10. The belt roller as claimed in claim 9, characterized in that the actuating drive (14) is of reversible design, for example as an electric motor  
15 (16) or as a pneumatic drive (17).

11. The belt roller as claimed in claim 9, characterized in that the actuating drive (14) is of irreversible design, for example as a pyrotechnic drive  
20 (18).

12. The belt roller as claimed in one of claims 8 to 10, characterized

- in that there is at least one threaded spindle (15)  
25 which on one side is mounted rotatably in a corresponding threaded bore (19) in the coupling element (6) and on the other side is rotationally fixedly connected to a rotor of the electric motor (16),
- 30 - in that the threaded spindle (15) is arranged parallel and inside the recess (13).

13. The belt roller as claimed in one of claims 8 to 10, characterized

- 35 - in that there is at least one slide rod (20) which is connected on one side to the pneumatic drive (17) or the pyrotechnic drive (18) and on the other side to the coupling element (6),

- in that the slide rod (20) is arranged parallel and inside the recess (13).

14. The belt roller as claimed in claim 11,  
5 characterized in that balls (21) are provided, which  
can be pressed onto the coupling elements (6) inside  
the recess (13) by means of the pyrotechnic actuating  
drive (18).